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Energy Independence and Security Act

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Energy Independence and Security Act

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Introduction

The Energy Independence and Security Act of 2007 is an energy policy law that consists of provisions designed to increase energy efficiency and the availability of renewable energy. This is a summary of the provisions under each of the titles in the law and is based on a report prepared by the Congressional Research Service for members of Congress. The specific report is RL-34294, Energy Independence and Security Act of 2007: a Summary of Major Provisions. While EISA'07 was enacted in 2007, many of the requirements are just now beginning to take effect and it remains very relevant today.

The three key provisions enacted are the Corporate Average Fuel Economy (CAFE) Standards, the Renewable Fuel Standard (RFS), and the appliance/lighting efficiency standards.

- **Corporate Average Fuel Economy (CAFE) Standards.** The law sets a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020. Also, a fuel economy program is established for medium- and heavy-duty trucks, and a separate fuel economy standard is created for work trucks.
- **Renewable Fuel Standard (RFS).** The law sets a modified standard that starts at 9.0 billion gallons of renewable fuel in 2008 and rises to 36 billion gallons by 2022. Of the latter total, 21 billion gallons is required to be obtained from cellulosic ethanol and other advanced biofuels
- **Appliance and Lighting Efficiency Standards.** Energy efficiency standards are set for broad categories of incandescent lamps, incandescent reflector lamps, and fluorescent lamps. A required target is set for lighting efficiency, and energy efficiency labeling is required for consumer electronic products. Also, efficiency standards are set by law for external power supplies, residential clothes washers, dishwashers, dehumidifiers, refrigerators, refrigerator/freezers, freezers, electric motors, residential boilers, commercial walk-in coolers, and commercial walk-in freezers. Further, DOE is directed to set standards by rulemaking for furnace fans and battery chargers.

Two controversial provisions that were not included in the enacted law were the proposed Renewable Energy Portfolio Standard (RPS) and the proposed repeal of tax subsidies for oil and gas.

Under an RPS, retail electric utilities must provide a minimum amount of electricity from renewable energy resources or purchase tradable credits that represent an equivalent amount of renewable energy production. The minimum requirement is often set as a percentage share of a

supplier's total retail electricity sales. It was proposed to include a national RPS target that aimed to reach 15% of total electricity sales by 2020. Up to 4 percentage points of the 15% target could be met with energy efficiency measures. However, this program was excluded from the Act.

Another provision that was excluded would have repealed about \$22 billion of oil and gas subsidies that were designed to offset the cost of supporting a variety of energy efficiency and renewable energy tax incentives. These proposed incentives would have included a four-year extension of the renewable energy electricity production tax credit. The law does include the repeal of two tax subsidies in order to offset the estimated cost to implement the CAFE provision.

Title I: Improved Vehicle Fuel Economy

Title I concerns improved vehicle fuel economy and includes new CAFE standards, funding assistance for advanced battery development, and federal fleet requirements.

Subtitle A. Increased Corporate Average Fuel Economy

This subtitle requires an increase in CAFE standards and a restructuring of the fuel economy program. A single CAFE standard of 35 miles per gallon (mpg) by model year 2020 (MY2020) is established, and the distinction between the passenger car and light truck fleet is preserved. The new standards will be based on vehicle attributes and expressed in the form of a mathematical function. Interim standards will be set, beginning with MY2011. Manufacturers will be required to come within 92% of the standard for a given model year. However, manufacturers can earn credits for exceeding the standards in one vehicle class that can be applied to boost, within limitations, the CAFE of a different vehicle class that is falling short of compliance.

CAFE originated with the Energy Policy Conservation Act of 1975. It is the sales weighted average fuel economy, expressed in miles per gallon of a manufacturer's fleet of passenger cars or light trucks with a gross vehicle weight rating (GVWR) of 8,500 lbs. or less, manufactured for sale in the United States, for any given model year. Fuel economy is defined as the average mileage traveled by an automobile per gallon of gasoline consumed as measured in accordance with the testing and evaluation protocol set forth by the Environmental Protection Agency (EPA).

Additionally, credits may be sold and bought between manufacturers. CAFE credits for the manufacture of flexible-fueled vehicles (FFV) are retained but phased out by model year 2020. Civil penalties assessed for non-compliance will be deposited to the general fund of the U.S. Treasury to support future rulemaking and to provide grants to manufacturers for research and development, and retooling in support of increasing the fuel efficiency of their fleets. The law requires the development of standards for "work trucks" and commercial medium- and heavy-duty on-highway vehicles.

Subtitle B. Improved Vehicle Technology

This subtitle establishes a loan guarantee program for advanced battery development, grant programs for plug-in hybrid vehicles, incentives for purchasing heavy-duty hybrid vehicles for fleets, and credits for various electric vehicles.

Subtitle C. Federal Vehicle Fleets

Federal agencies are prohibited from acquiring any light-duty motor vehicle or medium-duty passenger vehicle that is not "a low greenhouse gas emitting vehicle" as defined in this subtitle.

Alternatively, the agency may demonstrate that it has adopted cost-effective policies to reduce its petroleum consumption sufficiently to achieve a comparable reduction in greenhouse gas emissions. By 2015, federal agencies are required to achieve at least a 20% reduction in annual petroleum consumption and a 10% increase in annual alternative fuel consumption. These increases are to be calculated from a 2005 baseline. Interim milestones will be established and agencies will report annually on their progress. The regulations governing this program are required to be issued not later than 18 months after enactment.

Title II: Increased Production of Biofuels

Title II supports the increased production and use of biofuels. Included in this section is a renewable fuel standard and grants for biofuels R&D.

Subtitle A. Renewable Fuel Standard

This subtitle extends and increases the renewable fuel standard (RFS). The RFS requires minimum annual levels of renewable fuel in U.S. transportation fuel. The previous standard was 5.4 billion gallons for 2008, rising to 7.5 billion by 2012. The new standard starts at 9.0 billion gallons in 2008 and rises to 36 billion gallons in 2022. Starting in 2016, all of the increase in the RFS target must be met with advanced biofuels, defined as cellulosic ethanol and other biofuels derived from feedstock other than corn starch — with explicit carve-outs for cellulosic biofuels and biomass-based diesel. The EPA Administrator is given authority to temporarily waive part of the biofuels mandate, if it were determined that a significant renewable feedstock disruption or other market circumstance might occur. Renewable fuels produced from new bio-refineries will be required to reduce by at least 20% the life cycle greenhouse gas (GHG) emissions relative to life cycle emissions from gasoline and diesel. Fuels produced from bio-refineries that displace more than 80% of the fossil-derived processing fuels used to operate a bio-fuel production facility will qualify for cash awards. Several studies are required on the impacts of an RFS expansion on various sectors of the economy.

Subtitle B. Biofuels Research and Development (R&D)

This subtitle promotes research on the expansion of the use of biodiesel and biogas as motor fuels. Grants are authorized for R&D and commercial applications of cellulosic biofuels technologies and for the conversion of existing corn-based ethanol plants to produce cellulosic biofuels. The Secretary of Energy is required to report to Congress on the feasibility of algae as a feedstock for biofuels production. The subtitle also promotes university-based R&D on biofuels.

Subtitle C. Biofuels Infrastructure

This subtitle aims to improve information about federal biofuels research programs, focus research on infrastructure and bio-refineries, study potential impacts of increased biofuels use, and increase authorized funding for DOE biofuels research. A funding authorization of \$25 million is established to provide grants for biofuels research, development, and demonstration (RD&D) and commercial applications in states that have low rates of ethanol production. A university-based program is authorized to provide grants of up to \$2 million for R&D on renewable energy technologies. Priority is given to universities in low-income and rural communities with proximity to trees dying of disease or insect infestation.

DOE is directed to create a grant program to help establish or convert infrastructure to use renewable fuels, including E85 (85% ethanol). The Energy Policy Act of 2005 authorization for grants to support cellulosic ethanol production is increased. A grant program is authorized to support production of flexible-fueled vehicles. Studies are also required on the market penetration of flexible-fueled vehicles, the feasibility of constructing dedicated ethanol pipelines, the feasibility of using greater percentages of ethanol in fuel blends, and the adequacy of railroad transportation for delivery of ethanol fuel.

Subtitle D. Environmental Safeguards

Previously, under the Clean Air Act, no new fuels or fuel additives could be introduced into commerce unless granted a waiver by the Environmental Protection Agency (EPA). If EPA did not act within 180 days of receiving a waiver request, the waiver was treated as granted. Section 251 tightens the waiver provision. It amends the Clean Air Act to prohibit the introduction of new fuels or fuel additives unless EPA explicitly grants a waiver. After receiving a waiver request, EPA will now have 270 days to take final action.

Title III: Improved Standards for Appliances and Lighting

Title III sets standards for appliance and lighting efficiency.

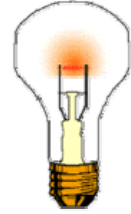
Subtitle A. Appliance Energy Efficiency

This title sets, by statute, new efficiency standards for external power supplies, residential clothes washers, dishwashers, dehumidifiers, refrigerators, refrigerator-freezers, freezers, electric motors, and residential boilers. DOE is allowed to establish regional variations in standards for heating and air conditioning equipment. DOE is required to complete a rulemaking process for furnace fans by 2013. Federal agencies are directed to purchase devices that limit standby power use. DOE is directed to issue a final rule that sets efficiency standards for battery chargers.

Certain energy efficiency measures for walk-in coolers and walk-in freezers are set by law. Also, several procedural changes are now in place to expedite the DOE rulemaking process.

Subtitle B. Lighting Energy Efficiency

Section 321 sets an energy efficiency standard for general service incandescent lamps, provides for consumer education and lamp labeling, and requires market assessments and a consumer awareness program. Section 322 sets energy efficiency standards for incandescent reflector lamps and fluorescent lamps. For instance, most incandescent lamps will be phased out beginning in 2012. For federal buildings, Section 323 sets energy efficiency requirements for GSA-leased space and for use of energy efficient lighting fixtures and bulbs in those leased spaces. Section 324 sets energy efficiency standards for metal halide lamp fixtures designed to be operated with lamps rated between 150 watts and 500 watts. Section 325 directs the Consumer Product Safety Commission to set energy efficiency labeling requirements for consumer electronic products.



Title IV: Energy Savings in Buildings and Industry

This title provides funding for weatherization of residential buildings and creates a “High Performance Green Building” program.

Subtitle A. Residential Building Efficiency

Section 411 increases the funding authorization for DOE’s Weatherization Program, providing \$3.75 billion over five years. Under Section 412, DOE is directed to conduct a study of the renewable energy system rebate program described in the Energy Policy Act of 2005. The study aims to determine the minimum funding the program would need to be viable. Further, DOE is directed to propose an implementation plan. Section 413 requires DOE to establish energy efficiency standards for manufactured housing.

Subtitle B. High-Performance Commercial Buildings

This subtitle encourages the development of more energy-efficient “green” commercial buildings. Section 421 creates an Office of Commercial High Performance Green Buildings at DOE. Section 422 establishes a zero-energy commercial buildings initiative. A national goal is set to achieve zero-net-energy use for new commercial buildings built after 2025. A further goal is to retrofit all pre-2025 buildings to zero-net-energy use by 2050. Section 423 requires that DOE establish a national clearinghouse for information and public outreach about high performance green buildings.

Subtitle C. High-Performance Federal Buildings

Section 431 requires that total energy use in federal buildings, relative to the 2005 level, be reduced 30% by 2015. Section 432 directs that federal energy managers conduct a comprehensive energy and water evaluation for each facility at least once every four years. For new federal buildings and major renovations, Section 433 requires that fossil-fuel energy use — relative to the 2003 level — be reduced 55% by 2010 and be eliminated (100% reduction) by 2030. Section 434 requires that each federal agency ensure that major replacements of installed equipment (such as heating and cooling systems), or renovation or expansion of existing space, employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective. Section 435 prohibits federal agencies from leasing buildings that have not earned an EPA Energy Star label. Section 436 requires GSA to establish an Office of Federal High-Performance Green Buildings to coordinate green building information and activities within GSA and with other federal agencies. The Office must also develop standards for federal facilities, establish green practices, review budget and life-cycle costing issues, and promote demonstration of innovative technologies. Section 437 directs the Government Accountability Office (GAO) to audit the implementation of activities required under this subtitle. The audit must cover budget, life-cycle costing, contracting, best practices, and agency coordination. Section 438 requires federal facility development projects with a footprint exceeding 5,000 square feet to use site planning, design, construction, and maintenance strategies to control storm water runoff. Section 439 directs GSA to review the current use of, and design a strategy for increased use of, cost-effective lighting, ground source heat pumps, and other technologies in GSA facilities. Section 440 authorizes \$4 million per year over five years to support work under sections 434-439 and 482. For the purpose of conducting life-cycle cost calculations, Section 441 increases the time period from 25 years, in prior law, to 40 years.

Subtitle D. Industrial Energy Efficiency

Section 451 directs DOE to conduct research on, develop, and demonstrate new processes, technologies, and operating practices and techniques to significantly improve the energy efficiency of equipment and processes used by energy-intensive industries. Section 452 directs EPA to establish a recoverable waste energy inventory program. This program must include an ongoing survey of all major industrial and large commercial combustion sources in the United States. EPA is required to identify the potential for economically feasible waste energy recovery, create a grant program to support waste energy recovery, and strengthen “clean energy centers” that analyze waste energy recovery. Section 453 directs DOE to initiate a voluntary national information program for widely used data centers and data center equipment for which there is significant potential for energy savings. DOE is also tasked with helping to devise strategies to improve energy efficiency at these data centers.

Subtitle E. Healthy High-Performance Schools

Section 461 creates a grant program for *Healthy High-Performance Schools* that aims to encourage states, local governments, and school systems to build green schools. EPA, in consultation with the Department of Education, is allowed to provide grants to state agencies to provide technical assistance and help with the development of state plans for school building design. Also, EPA is directed to develop model voluntary guidelines for school site selection. In addition to other environmental aspects, the grants and guidelines must have a focus on energy efficiency, natural day-lighting, and other energy-related features. Section 462 directs EPA to lead a detailed study of how sustainable building features, such as energy efficiency, affect multiple perceived indoor environmental quality stressors on students in K-12 schools.

Subtitle F. Institutional Entities

Section 471 creates a program of grants and loans to support energy efficiency and energy sustainability projects at public institutions.

Subtitle G. Public and Assisted Housing

Section 481 directs the Department of Housing and Urban Development (HUD) to update energy efficiency standards for all public and assisted housing.

Subtitle H. General Provisions

Section 491 calls for the DOE Office of Commercial High Performance Buildings and the GSA Office of Federal High Performance Buildings to jointly develop guidelines for demonstration projects. In accordance with the guidelines, one federal project must be undertaken annually over a five-year period, supported by a \$10 million funding authorization. Also, a total of four projects are to be undertaken at different universities over the five-year period, supported by an additional \$10 million funding authorization. Section 492 calls for these two offices to undertake a joint survey of research on green buildings, coordinate efforts to develop a research plan, and identify potential benefits of green buildings for security, natural disasters, and emergency needs of the federal government. Section 493 requires EPA to create a program of competitive grants to local governments for green building demonstration projects. Section 494 directs the Office of Commercial High Performance Buildings and the Office of Federal High Performance Buildings to jointly appoint a Green Building Advisory Committee with representatives from a variety of backgrounds, including federal agencies, state and local governments, building industry experts, security advisors, and environmental health experts. Section 495 calls for DOE to create an

advisory committee on energy efficiency finance to help lower costs and increase investment for energy efficiency technologies.

Title V: Energy Savings in Government and Public Institutions

This title addresses energy savings in public buildings and includes grant recommendations for State efficiency programs.

Subtitle A. United States Capitol Complex

Section 501 allows the Architect of the Capitol (AOC) to perform a feasibility study regarding construction of a photovoltaic roof for the Rayburn House Office Building. Under Section 502, the AOC is allowed to construct a fuel tank and pumping system for E85 (85% ethanol) fuel at the Capitol Grounds Fuel Station. Section 503 requires the AOC, to the maximum extent practicable, to include energy efficiency measures, climate change mitigation measures, and other appropriate environmental measures in the Capitol Complex Master Plan. Under Section 504, the AOC is directed to operate the steam boilers and chiller plant at the Capitol Power Plant in the most energy efficient manner possible to minimize carbon emissions and operating costs. Further, Section 505 requires the AOC to install technologies for the capture and storage or use of carbon dioxide emitted from coal combustion in the Capitol Power Plant.



Subtitle B. Energy Savings Performance Contracting

Section 511 eliminates the advance reporting requirement for Energy Savings Performance Contracts (ESPCs) that have a cancellation ceiling exceeding \$10 million. Section 512 increases ESPC funding flexibility by allowing a combination of appropriated funds and private financing. Section 513 restricts federal agencies from limiting the duration of ESPCs to less than 25 years or limiting the total amount of obligations. Further, this section permits the criteria for savings verification to satisfy the requirement for energy audits. Also, it directs federal agencies to modify existing ESPCs to conform to the requirements of this subtitle. Section 514 permanently authorizes ESPCs.

Section 515 extends the definition of energy savings reduction to include increased use of an existing energy source by cogeneration or heat recovery, use of excess electrical or thermal energy generated from onsite renewable sources or cogeneration, and increased energy-efficient use of water resources. Section 516 permits agencies to retain the full amount of energy and water cost savings obtained from utility incentive programs. Section 517 authorizes \$750,000 per

year over five years for a program to train contract officers in negotiating ESPCs. Section 518 directs the Department of Defense (DOD) and DOE to study the potential use of ESPCs in non-building applications, which is defined to include vehicles and federally owned equipment to generate electricity or transport water.

Subtitle C. Energy Efficiency in Federal Agencies

Under Section 521, GSA is directed to use up to \$30 million — subject to appropriation — from FY2007 and prior years' unobligated balances of the Federal Buildings Fund to support the installation of a solar photovoltaic system for the DOE headquarters building in the District of Columbia. Section 522 prohibits, except under certain circumstances, the purchase of incandescent light bulbs for use in Coast Guard office buildings. Section 523 requires 30% of the hot water demand in new federal buildings (and major renovations) to be met with solar hot water equipment, provided it is life-cycle cost-effective. Section 524 encourages federal agencies to minimize standby energy use in purchases of energy-using equipment. Section 525 requires federal procurement to focus on use of Energy Star and Federal Energy Management Program (FEMP)-designated products. Section 526 prohibits federal agencies from procuring synfuel unless its life cycle GHG emissions are less than those for conventional petroleum sources. Section 527 directs each federal agency subject to any requirements under this title to issue an annual report that describes the status of initiatives to improve energy efficiency, reduce energy costs, and reduce GHG emissions.

Section 528 requires the Office of Management and Budget (OMB) to submit an annual report to Congress that summarizes the information reported under Section 527, evaluates overall progress toward the goals of Section 527, and recommends additional actions needed to meet those goals. Section 529 directs the Federal Energy Regulatory Commission (FERC) to conduct a national assessment of demand response, including an estimate of nationwide demand response out to a 10-year horizon. Further, FERC is required to prepare a National Action Plan on Demand Response, with cooperation from industry. Annual funding of \$10 million per year is authorized over three years.

Subtitle D. Energy Efficiency of Public Institutions

Section 531 increases annual funding authorizations for DOE's state energy programs. Under Section 532, electric and natural gas utilities are required to make energy efficiency a priority resource and to integrate energy efficiency into resource plans and planning processes. Further, the utilities are directed to modify their rates to align their incentives with the delivery of cost-effective energy efficiency and promote energy efficiency investments. Utilities are encouraged to consider several policy options for achieving those goals.

Subtitle E. Energy Efficiency and Conservation Block Grants

This subtitle establishes an energy efficiency block grant program. Section 541 provides definitions of program elements. Section 542 directs DOE to establish an energy efficiency and conservation block grant program to help reduce energy use and emissions at the local and regional level. Section 543 establishes allocation percentages for grants provided under this subtitle. Section 544 enumerates the allowed purposes for the use of funds provided under this subtitle, which includes strategic planning, consultant services, and energy audits. Section 545 provides eligibility requirements for grants under this program, including payment of prevailing wage rates, submission of a strategic plan, and sharing of information. Section 546 sets criteria for minimum allocations of competitive grant funding.

Section 547 specifies that DOE may review and evaluate the performance of grant recipients and withhold funds from those it deems have failed to achieve compliance. To support the grant program, Section 548 authorizes \$2 billion annually over five years. Additional funding is authorized to cover administrative costs of the program.

Section 548 stresses that funding will supplement, not replace, funding provided by DOE under the Weatherization and State Energy programs.

Title VI: Accelerated Research and Development

This title addresses more research and development in renewable energy sources and energy efficiency programs.

Subtitle A. Solar Energy

Section 602 aims to improve the cost and effectiveness of thermal energy storage technologies that could improve the operation of concentrating solar power electric generating plants. Section 603 calls for improved integration of concentrating solar power into regional electricity transmission systems.

Subtitle B. Geothermal Energy

DOE is directed to support programs of R&D, demonstration, and commercial application to expand the use of geothermal energy. Section 613 directs DOE to support programs that (1) develop advanced prospecting tools to locate and develop hidden geothermal resources, and (2) demonstrate advanced exploratory drilling technologies and techniques with industry partners. Section 614 directs DOE to support programs to develop components and systems necessary to develop, produce, monitor, and model the performance of geothermal reservoirs used to produce

geothermal energy. In addition, Section 614 directs DOE to support programs that mitigate or prevent environmental damage from geothermal energy development. Section 615 directs DOE to support enhanced geothermal system development, whereby geothermal reservoir systems are engineered by creating fractures and permeable conduits via reservoir stimulation. DOE would support R&D programs for enhanced geothermal system technologies and for reservoir stimulation and support demonstration projects at a minimum of four sites.

DOE is directed to establish a program of R&D, demonstration, and commercial application for geothermal energy production from oil and gas fields and from geo-pressured resources. Section 616 directs DOE to implement a grant program for at least three demonstration projects that use geothermal techniques to extract energy from marginal, unproductive, and productive oil and gas fields. Also, DOE is directed to establish a grant program for the recovery of energy from geo-pressured resources.

Geo-pressured resources are geothermal deposits of hot water or steam found in sedimentary rocks under higher than normal pressures and that are saturated with oil and gas.

Section 618 directs DOE to establish a Center for Geothermal Technology Transfer, via a grant to an institution of higher learning or consortium thereof, that would serve as an information clearinghouse for the geothermal industry, make data available to the public, and coordinate R&D efforts among national and international partners. Section 619 would rename DOE's Geo-Powering the West program as "Geo-Powering America" and expand its geothermal technology transfer activities to cover the entire United States. Section 620 would award a grant on a competitive basis to an institution of higher education to establish a geothermal-powered energy generation facility on the institution's campus.

Section 624 directs DOE to support international geothermal energy development through collaborative efforts to promote geothermal R&D and deployment of geothermal technologies. Section 625 directs DOE to make grants to eligible entities from "high-cost regions" of the United States for a feasibility study, demonstration, and commercial application of technologies related to geothermal energy. Subtitle B authorizes \$90 million annually for geothermal activities, of which \$10 million is designated for activities under Section 616. An additional \$5 million is authorized annually for the Intermountain West Geothermal Consortium, and \$5 million is authorized annually for Section 624. All of the foregoing authorizations are in effect from 2008 to 2012.

"High cost" regions are defined as places where the average cost of retail power exceeds 150% of the national average.

Subtitle C. Marine and Hydrokinetic Renewable Energy Technologies

DOE is directed to create an R&D program focused on technology that produces electricity from waves, tides, currents, and ocean thermal differences. A report to Congress is required. Further, DOE is instructed to award grants to institutions of higher education to establish National Marine Renewable Energy Research, Development, and Demonstration Centers.

Subtitle D. Energy Storage for Transportation and Electric Power

The U.S. Energy Storage Competitiveness Act of 2007 directs DOE to conduct a cost-shared RD&D program to support the ability of the nation to remain globally competitive in energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution. An Energy Storage Advisory Council will be created, with responsibility for preparing a five-year research plan. Also, through competitive bids, DOE will establish four energy storage research centers managed by the Office of Science. DOE is required to conduct energy storage demonstration projects. Also, DOE is to investigate secondary applications of energy storage equipment and to examine technologies and processes for final recycling and disposal of energy storage equipment. After five years of program operation, the law will require a review of the program by the National Academy of Sciences. A total authorization of nearly \$3 billion is provided over a 10-year period.

Subtitle E. Miscellaneous Provisions

Section 651 directs DOE to establish an RD&D program to determine ways in which the weight of motor vehicles could be reduced to improve fuel efficiency without compromising passenger safety. This will focus on the development of new materials and on reducing the cost of lightweight materials. An \$80 million authorization is provided over a five-year period. Section

R-value insulation ratings are used to measure insulation's ability to resist heat flow. The higher the R value, the more effective it is.

652 directs DOE to report on the state of technology development for "advanced" insulation with an R-value greater than R35 per inch. The report is to include an estimate of potential cost savings by applying such insulation to covered refrigeration units. If sufficient cost savings are projected, DOE will then be directed to conduct a cost-shared demonstration program to show actual cost savings. An \$8 million funding authorization is provided for that program.

Section 653 changes the sulfur dioxide (SO₂) criterion for clean coal power plants from a percentage basis (99% of SO₂ removed) to a weight-by-energy basis (no more than 0.04 pounds of SO₂ per million Btu).

Section 654 on the “H-Prize” directs DOE to conduct a competitive program to award cash prizes to advance R&D, demonstration, and commercial application of hydrogen energy technologies. Prizes can be a mix of federal appropriations and funds provided by an entity that DOE chooses to administer the program. The program ends in 2018. Prize categories include technology advancements in hydrogen production, storage, distribution, and use; prototypes of hydrogen vehicles and products; and technologies that “transform” distribution or production. DOE is required to report to Congress annually, identifying award recipients, technologies developed, and specific actions undertaken to commercialize the technologies. More than \$1 billion is authorized over a 10-year period.

Section 655 directs DOE to create the “Bright Tomorrow” lighting prizes for solid state (LED) lighting developments that achieve targeted levels of energy efficiency and other traits. Two specific categories are a solid state replacement for a 60-watt incandescent light and a replacement for the PAR Type 38 halogen light. Also, a prize is established for a “twenty-first century lamp” that achieves certain output, efficiency, and color targets. After the awards are made, DOE is required to develop guidelines for federal agency purchases of the incandescent and halogen replacements, with the goal of complete replacement within five years.

Section 656 directs DOE to establish a cost-shared Renewable Energy Innovation Manufacturing Partnership Program to make awards to support RD&D on advanced manufacturing processes, materials, and infrastructure for renewable energy technologies. Further goals are to increase domestic renewable energy production and better coordinate federal, state, and private resources through partnerships. Solar, wind, biomass, geothermal, energy storage, and fuel cell systems are eligible forms of equipment.

Title VII: Carbon Capture and Sequestration

This section encourages R&D activity in the concept of carbon sequestration.

Subtitle A. Carbon Research, Development, and Demonstration

DOE’s program for carbon capture and sequestration R&D is expanded and will include large-scale demonstration projects. DOE is directed to engage the National Academy of Sciences (NAS) to conduct a review of the program. DOE is directed to work with the NAS to develop interdisciplinary graduate degree programs with emphasis on geologic sequestration

Carbon sequestration refers to the provision of long-term storage of carbon in the terrestrial biosphere, underground, or the oceans so that the buildup of carbon dioxide (the principal greenhouse gas) concentration in the atmosphere will reduce or slow.

science. A university-based R&D grant program will be established to study carbon capture and sequestration using various types of coal. EPA is directed to assess potential impacts of carbon

sequestration on public health and safety and the environment. Further, injection and sequestration activities under this subtitle are subject to the requirements of the Safe Drinking Water Act.

Subtitle B. Assessment and Framework

Section 711 directs the Department of the Interior (DOI) to develop a methodology for an assessment of the national potential for geologic storage of carbon dioxide. Following publication of the methodology, DOI will be required to complete an assessment of national capacity for carbon dioxide storage in accordance with the methodology.

Section 712 directs DOI to develop a methodology for an assessment of the total capacity of ecosystems to sequester carbon and the ability of ecosystems to reduce emissions of carbon dioxide, methane, and nitrous oxides in ecosystems through management practices. Following publication of the methodology, DOI will be required to complete a national assessment of the quantity of carbon stored in and released from ecosystems, and the annual flux of carbon dioxide, methane, and nitrous oxides in and out of ecosystems.

Section 713 calls for DOI to maintain records, and an inventory, of the quantity of carbon dioxide stored within federal mineral leaseholds.

Section 714 directs DOI to submit a report on a recommended regulatory framework for managing geologic carbon sequestration on public lands. The report must include an assessment of options to ensure that the United States receives fair market value for the use of public land, the proposed procedures for public review and comment, procedures for protecting natural and cultural resources of the public land overlying the geologic sequestration sites, a description of the status of liability issues related to the storage of carbon dioxide in public land, identification of legal and regulatory issues for cases where the United States owns title to the mineral resources but not the overlying land, identification of issues related to carbon dioxide pipeline rights-of-way, and recommendations for additional legislation that may be required for adequate public land management and leasing to accommodate geologic sequestration of carbon dioxide and pipeline rights-of-way.

Title VIII: Improved Management of Energy Policy

Title VIII is a hodge-podge of energy policy concepts from matching grants for small renewable projects to requirements that energy companies play fair.

Subtitle A. Management Improvements

Section 801 directs DOE to conduct a 10-year national media campaign to educate consumers to save energy and reduce oil use. Competitive bidding is required for contracting the media services. A funding authorization of \$5 million per year is provided for five years. An annual report to Congress is required.

Section 802 authorizes the Federal Coordinator for the Alaska Natural Gas Transportation Projects to appoint and terminate personnel and to pay appointed and temporary personnel up to a maximum of the level III rate of the Executive Schedule.

The Federal Coordinator is granted authority to establish various payment requirements and to use funds raised without further appropriation. This authority does not affect the authority of the Secretary of the Interior.

Section 803 creates a 50% matching grant program for constructing small renewable energy projects that will have an electrical generation capacity less than 15 megawatts. Eligible applicants include local governments, utilities, and Indian tribes. Such sums as necessary are authorized for the program.

Section 804 requires the Energy Information Administration (EIA) to monitor planned petroleum refinery outages and report to the Secretary of Energy when such outages are affecting the price or availability of petroleum products. The Secretary will then be required to share data with refinery operators and encourage reductions in out-of-service refinery capacity.

Section 805 requires the Administrator of the Energy Information Administration (EIA) to develop a five-year plan for enhancing the scope, quality, and timeliness of the agency's data collection efforts. In addition, it requires closer coordination by EIA with state energy officials and with the Federal Energy Regulatory Commission. The section addresses state-level data in several respects and requires the Administrator to submit to Congress within a year an assessment of state level energy data needs. EIA is directed to revisit certain data series that had been terminated due to budget constraints and to identify data gaps that may have resulted from those terminations. To implement this section, \$10 million is authorized for 2008, and additional sums are authorized through 2012.

Section 806 expresses the sense of Congress that there is a national goal to use renewable energy resources from agricultural, forestry, and working lands of the nation to provide at least 25% of the nation's energy use by 2025. Section 807 directs the Department of the Interior's U.S. Geological Survey to conduct a comprehensive assessment of geothermal energy resources in the United States and report the findings of that assessment to Congress.

Subtitle B. Prohibitions on Market Manipulation and False Information

This subtitle prohibits crude oil and petroleum product wholesalers from using any technique to manipulate the market or provide false information. The law directs the Federal Trade Commission to treat such action as an unfair or deceptive practice, subject to civil penalties of not more than \$1 million per incident.

Title IX: International Energy Programs

This title authorizes assistance to promote clean and efficient energy technologies in foreign countries, and it establishes an International Clean Energy Foundation.

Subtitle A. Promote Clean Efficient Energy Technologies in Foreign Countries

The U.S. Agency for International Development (USAID) is directed to report to Congress on efforts to support policies for clean and efficient energy technologies.

The Department of Commerce is directed to increase efforts to export such technologies and report to Congress on the results. Other U.S. agencies with export promotion responsibilities are required to increase efforts to support these technologies. Also, a multi-agency Task Force on International Cooperation for Clean and Efficient Energy Technologies is created to support the implementation of clean energy markets in key developing countries.

Section 917 creates a U.S.-Israel Energy Cooperation partnership to support research, development, and deployment (RD&D) of energy efficiency and renewable energy measures.

Subtitle B. International Clean Energy Foundation

The Foundation is established with the long-term goal of reducing GHG emissions. It is directed to use the funds authorized by this subtitle to make grants to promote projects outside of the United States that serve as models of how to reduce emissions. An annual report to Congress is required.

Subtitle C. Miscellaneous Provisions

Section 931 calls for the Secretary of State to ensure that energy security is integrated into the core mission of the Department of State. Energy advisors are required at key embassies, and the Department is required to report to Congress every two years on its energy-related activities. Section 932 adds the Secretary of Energy to the National Security Council. Section 933 calls for the President to submit to Congress a comprehensive annual report that describes a national energy security strategy for the nation.

Section 934 implements the Convention on Supplementary Compensation for Nuclear Damage that was opened for signature in 1997. The convention has since been signed by the United States and 12 other countries but has not yet entered into force. Each party to the convention will be required to establish a compensation system within its borders for nuclear damages to the public. In the United States, this obligation will be fulfilled by the existing Price-Anderson Act. The convention will also establish a second tier of damage compensation to be paid by all parties. Section 934 requires the U.S. contribution to the second tier to be paid by suppliers of nuclear equipment and services, under a formula to be developed by DOE. Supporters of the convention contend that it will help U.S. exporters of nuclear technology by establishing a predictable international liability system.

Section 935 has the stated purpose of improving national energy security by promoting anti-corruption initiatives in oil and natural gas rich countries and of improving global energy security by promoting programs such as the Extractive Industries Transparency Initiative (EITI) that aim to increase transparency and accountability into extractive resource payments. The sense of Congress is expressed that global energy security should be furthered by encouraging further participation in EITI by eligible countries and companies and by promoting the effectiveness of the EITI program by ensuring that a robust and candid review mechanism is put in place. The Secretary of State is required to report to Congress on progress made in promoting transparency in extractive industries resource payments. An authorization of \$3 million is provided to support U.S. contributions to the Multi-Donor Trust Fund of EITI.

Title X: Green Jobs

This title authorizes up to \$125 million in funding to establish national and state job training programs, administered by the Department of Labor, to help address job shortages that are impairing growth in green industries, such as energy efficient buildings and construction, renewable electric power, energy efficient vehicles, and biofuels development.

Title XI: Energy Transportation and Infrastructure

Subtitle A. Department of Transportation (DOT)

An Office of Climate Change and Environment is established at DOT to plan, coordinate, and implement strategies to reduce transportation-related energy use, mitigate the effects of climate change, and address the impact of climate change on transportation systems and infrastructure.

Subtitle B. Railroads

This subtitle directs DOT, in coordination with EPA, to establish and conduct a pilot grant program to assist railroad carriers in purchasing hybrid locomotives, including hybrid switch locomotives, in order to demonstrate the extent to which such locomotives increase fuel economy, reduce emissions, and lower costs of operation. Also, DOT is directed to create a program of capital grants for the rehabilitation, preservation, or improvement of railroad track (including roadbed, bridges, and related track structures) of class II and class III railroads.

Subtitle C. Marine Transportation

Short sea transportation is defined as commercial waterborne transportation that originates at a port in the United States and ends at another port in the United States or at a port in Canada located in the Great Lakes Saint Lawrence Seaway System. The same definition applies for the case where origination and end points are reversed. This subtitle directs DOT to establish a short sea transportation program and designate short sea transportation projects to be conducted under the program to mitigate landside congestion. Short sea shipping activities are made eligible for support from DOT's capital construction fund. A report to Congress on the short sea transportation program is required.

Subtitle D. Highways

Section 1131 increases the federal share for congestion mitigation and air quality (CMAQ) projects up to 100% of project or program cost. Under Section 1132, DOT is directed to redistribute within each state any unobligated balances of the Highway Trust Fund that are rescinded in FY2008 or FY2009. Section 1133 expresses a sense of Congress that, in constructing new roadways or rehabilitating existing facilities, state and local governments should employ policies designed to accommodate all users, including motorists, pedestrians, cyclists, transit riders, and people of all ages and abilities.

Title XII: Small Business Energy Programs

Loans, grants, and debentures are established to help small businesses develop, invest in, and purchase energy efficient buildings, fixtures, equipment, and technology. Section 1201 empowers the Small Business Administration (SBA) to make "express" loans for certain energy efficiency and renewable energy projects. Section 1202 creates a two-year pilot loan program for purchasing energy efficient technologies under Section 7(a) of the Small Business Act at half the cost that would have otherwise been required. After the pilot program terminates, GAO is required to prepare a report to Congress that describes its energy-saving impact. Section 1203 creates small business energy efficiency, sustainability, and telecommuting programs. Reports to

Congress are required for each of those programs. Section 1204 raises the Small Business Investment Act (SBIA) loan ceilings for certain energy efficiency and renewable energy projects undertaken by small businesses. Section 1205 enables qualified small business investment companies to issue energy-saving debentures. The Smart Grid could allow appliances to be turned off during periods of high electrical demand and cost and give customers real-time information on constantly changing electric rates. The goal is to use advanced, information-based technologies to increase power grid efficiency, reliability, and flexibility, and reduce the rate at which additional electric utility infrastructure needs to be built.

Section 1206 expands certain SBIA provisions to include investments in energy saving small businesses. Section 1207 creates a Renewable Fuel Capital Investment (RFCI) pilot program that taps into venture capital to help small firms develop renewable energy sources and new technologies. A funding authorization of \$30 million is provided for RFCI over two years. Section 1208 requires SBA to study the RFCI program and issue a report to Congress on its findings.

Title XIII: Smart Grid

The term Smart Grid refers to a distribution system that allows for flow of information from a customer's meter in two directions: both inside the house to thermostats and appliances and other devices, and back to the utility. This could allow appliances to be turned off during periods of high electrical demand and cost, and give customers real-time information on constantly changing electric rates. Efforts are being made in both industry and government to modernize electric distribution to improve communications between utilities and the ultimate consumer. The goal is to use advanced, information-based technologies to increase power grid efficiency, reliability, and flexibility, and reduce the rate at which additional electric utility infrastructure needs to be built.

Both regulatory and technological barriers have limited the implementation of Smart Grid technology. At issue is whether a distinction for cost allocation purposes can be made between the impact of Smart Grid technology on the wholesale transmission system and its impact on the retail distribution system. Another issue limiting the deployment of this technology is the lack of consistent standards and protocols. There currently are no standards for these technologies. This limits the interoperability of Smart Grid technologies and limits future choices for companies that choose to install any particular type of technology.



Photo Courtesy Department of Energy

The Act contains provisions to encourage research, development, and deployment of Smart Grid technologies. Provisions include requiring the National Institute of Standards and Technology to be the lead agency to develop standards and protocols; creating a research, development, and demonstration program for Smart Grid technologies at the Department of Energy; and providing federal matching funds for portions of qualified Smart Grid investments.

Section 1301 establishes a federal policy to modernize the electric utility transmission and distribution system to maintain reliability and infrastructure protection. The term “Smart Grid” refers to a distribution system that allows for flow of information from a customer’s meter in two directions: both inside the house to thermostats, appliances, and other devices, and from the house back to the utility. Smart Grid is defined to include a variety of operational and energy measures — including smart meters, smart appliances, renewable energy resources, and energy efficiency resources.

Section 1302 requires that the DOE report to Congress on the deployment of Smart Grid technologies and any barriers to the deployment of these technologies.

Section 1303 directs DOE to establish a Smart Grid Advisory Committee and a Smart Grid Task Force to assist with implementation.

Section 1304 directs DOE to conduct Smart Grid RD&D and to develop measurement strategies to assess energy savings and other aspects of implementation. Section 1305 directs the National Institute of Standards and Technology to establish protocols and standards to increase the flexibility of use for Smart Grid equipment and systems. Section 1306 directs DOE to create a program that reimburses 20% of qualifying Smart Grid investments.

Section 1307 directs states to encourage utilities to employ Smart Grid technology and allows utilities to recover Smart Grid investments through rates. Section 1308 requires DOE to prepare a report to Congress on the effect of private wire laws on the development of combined heat and power facilities. Section 1309 directs DOE to report to Congress on the potential impacts of Smart Grid deployment on the security of electricity infrastructure and operating capability.

Title XIV: Pool and Spa Safety

This section of the Act deals with swimming pool safety. It is probably a worthy cause, but is unrelated to the energy issues covered by the Act.

Title XV: Revenue Provisions

This is another section of the Act that is unrelated to the energy issues of the Act. This section extends the Federal Unemployment Tax Act (FUTA) taxes for one year.

Title XVI: Effective Date

Section 1601 specifies that this act and the amendments it makes will take effect one day after enactment.

Summary

In some respects, the Energy Independence and Security Act of 2007 is a modification of the Energy Policy Act of 2005. The Act is an energy policy law that consists of provisions designed to increase energy efficiency and the availability of renewable energy. The key provisions of the Act address improving the Corporate Average Fuel Economy (CAFE) Standards, the Renewable Fuel Standard (RFS), and the appliance/lighting efficiency standards.

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